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09/805,692	03/13/2001	Julian A. Fells	678-1192	4489

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EXAMINER	
LI, SHI K	

ART UNIT	PAPER NUMBER
2633	7

DATE MAILED: 07/31/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/805,692	Applicant(s) FELLS ET AL.
	Examiner Shi K. Li	Art Unit 2633

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 June 2003* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-70* is/are pending in the application.

4a) Of the above claim(s) *1-43 and 66-70* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *44-65* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *2,3,4* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

Election/Restrictions

1. Applicant's election of Group IV, consisting of claims 44-65, in Paper No. 6 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)). The election requirement is made final.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 44-45, 47-53, 57-58 and 60-63 are rejected under 35 U.S.C. 102(e) as being anticipated by Ibukuro et al. (U.S. Patent 6,573,985 B2).

Regarding claims 44-45 and 57, Ibukuro et al. teaches in FIG. 4 an arrangement for measuring dispersion. In FIG. 4, the optical intensity modulator 23 is modulated by the high-frequency oscillator 21 and generates upper and lower sidebands. A photodetector 26 detects the optical signal. The band-pass filters 28-1 and 28-2 filter the electrical signal and pass the signal to intensity detectors 29-1 and 29-2.

Regarding claims 47-48 and 60, Ibukuro et al. teaches in FIG. 13 the use of an optical filter to extract the signal used for dispersion monitoring.

Regarding claims 50 and 58, the photodetector 26 is a photodiode (see col. 6, line 33).

Regarding claims 51 and 61, Ibukuro et al. discloses in FIG. 13 an adjustable dispersion compensation arrangement. FIG. 13 comprises variable dispersion compensator 75, wavelength dispersion monitor 74, which may include a control circuit 61 as illustrated in FIG. 12.

Regarding claims 52 and 62, the optical signal for the dispersion monitor in FIG. 13 is tapped off before the variable dispersion compensator 75.

Regarding claims 51, 53, 61 and 63, Ibukuro et al. discloses another arrangement in FIG. 14 where the dispersion monitor and dispersion compensator are arranged in a feedback loop.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 46 and 59 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ibukuro et al. (U.S. Patent 6,573,985 B2) in view of Noé et al. (Noé et al., "Polarization Mode Dispersion Compensation at 10, 20, and 40 Gb/s with Various Optical Equalizers", Journal of Lightwave Technology, Vol. 17, No. 9, September 1999) and Ooi et al. (U.S. Patent Application Pub. 2002/0018266 A1).

Ibukuro et al. has been discussed above in regard to claims 44-45, 47-53, 57-58 and 60-63. The difference between Ibukuro et al. and the claimed invention is that Ibukuro et al. does not teach to measure power at bandwidths centered on relative frequencies f, $\sqrt{2}$ f and 2f. Noé et al. teaches in FIG. 17 and FIG. 21 the measure of three frequency bands centered at f, 2f and 4f. Ooi et al. teaches in FIG. 10 to monitor the power at three different bands. Ooi et al. teaches in

FIG. 3, FIG. 11 and col. 6, paragraph [0078] to page 7, paragraph [0084] the principle for choosing the frequencies. The basic idea is to gather more information about the dispersion around the frequency band of interest. One of ordinary skill in the art would have been motivated to combine the teaching of Noé et al. and Ooi et al. with the dispersion measuring apparatus of Ibukuro et al. and choose frequency values of f, $\sqrt{2}$ f and 2f, or f, 2f and 4f, or other appropriate values based on the teaching of Ooi et al. because gathering more information about the dispersion allows better control and compensation of the dispersion. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to measure power at bandwidths centered on relative frequencies f, $\sqrt{2}$ f and 2f, based on the teaching of Noé et al. and Ooi et al., in the dispersion measuring apparatus of Ibukuro et al. because gathering more information about the dispersion around the frequency of interest allows better control and compensation of the dispersion.

6. Claims 54-55, 64 and 65 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ibukuro et al. (U.S. Patent 6,573,985 B2) in view of Ooi et al. (U.S. Patent Application Pub. 2002/0018266 A1).

Ibukuro et al. has been discussed above in regard to claims 44-45, 47-53, 57-58 and 60-63. The difference between Ibukuro et al. and the claimed invention is that Ibukuro et al. does not include the dithering of the dispersion via the dispersion compensator. Ooi et al. teaches in page 8, paragraphs [0095]-[0098] the use of dithering to guide the optimization of the compensation. One of ordinary skill in the art would have been motivated to combine the teaching of Ooi et al. with the dispersion compensation system of Ibukuro et al. because dithering the dispersion allows the controller to track the effect of the compensation and optimize

the compensation. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to include the dithering of the dispersion, as taught by Ooi et al., in the dispersion compensation system of Ibukuro et al. because dithering the dispersion allows the controller to track the effect of the compensation and optimize the compensation.

7. Claim 56 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ibukuro et al. and Ooi et al. as applied to claims 54-55 and 64-65 above, and further in view of Bulmer et al. (U.S. Patent 4,968,110).

Ibukuro et al. and Ooi et al. have been discussed above in regard to claims 54-55 and 64-65. The difference between the modified dispersion compensation system of Ibukuro et al. and Ooi et al. and the claimed invention is that Ibukuro et al. and Ooi et al. do not teach the lock-in amplifier. Bulmer et al. teaches the use of lock-in amplifiers to measure the power of a dithered signal. One of ordinary skill in the art would have been motivated to combine the teaching of Bulmer et al. with the modified dispersion compensation system of Ibukuro et al. and Ooi et al. because a lock-in amplifier can extract the dithered signal out from other unwanted signals. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to include a lock-in amplifier to extract the dithered signal, as taught by Bulmer et al., in the modified dispersion compensation system of Ibukuro et al. and Ooi et al. because a lock-in amplifier can extract and measure the power and phase of the dithered signal out from other unwanted signals.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

a. Ishikawa et al. (U.S. Patent 6,081,360) discloses an apparatus for dispersion compensation based on the power level at the receiving end.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shi K. Li whose telephone number is 703 305-4341. The examiner can normally be reached on Monday-Friday (8:30 a.m. - 5:00 p.m.).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on 703 305-4729. The fax phone numbers for the organization where this application or proceeding is assigned are 703 872-9314 for regular communications and 703 872-9314 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703 305-3900.

skl
July 17, 2003

JASON CHAN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600